

IN THE DRAWINGS:

Substitute drawing sheets are enclosed for FIGS. 2, 3 and 5 to replace the original drawing sheets filed with the application. No new matter has been added. Specifically, the following amendments have been made:

FIG. 2:

Reference number "109" replaced with "108."

Reference number "200" replaced with "106."

Insert "Symbol clock recovery" block "107."

FIG. 3:

Reference number "201" replaced with "206."

Reference number "202" replaced with "207."

Insert "Digital processor" block "108."

FIG. 5:

Reference numbers "601" to "608" replaced with "401" to "408."

REMARKS

Applicant has studied the Office Action dated May 23, 2005, and has made amendments to the claims. Claims 1-15 are pending. Claims 1-3, 6-9 and 11-15 have been amended. Claims 1, 10 and 13 are independent claims. No new matter has been added. It is submitted that the application, as amended, is in condition for allowance. Reconsideration and reexamination are respectfully requested.

Amendments to Drawings

Amendments have been made to the FIGS. 2, 3 and 5 in response to objections by the Examiner. No new matter has been added as the amendments have support in the application as originally filed.

Amendments to Specification

Amendments have been made to the specification at paragraphs 4, 7, 11, 15, 20, 26, 30, 32, 42-50, 52 and 54 in response to objections by the Examiner. Additional amendments have been made to correct typographical errors and more clearly disclose the invention. No new matter has been added as the amendments have support in the application as originally filed.

Amendments to Claims

Claims 2, 3, 6-9 and 11-15 have been amended in response to objections by the Examiner. Claims 1, 2, 6, 8, 11 and 14 have been amended in response to 35 U.S.C. §112 rejections by the Examiner. Additional amendments have been made to correct typographical errors and more clearly disclose the invention. No new matter has been added as the amendments have support in the application as originally filed.

Objections to Drawings

The Examiner objected to the drawings as failing to comply with 37 CFR 1.83 and 1.84. Specifically, the Examiner asserted that the drawings fail to comply with 37 CFR 1.84(p)(4) because reference numbers "108" and "109" are both used to designate the "digital processor,"

reference number “201” is used to designate both the “complex multiplier” in FIG. 2 and the “resampler” in FIG. 3 and reference number “202” is used to designate both the “low pass filter” in FIG. 2 and the “fixed oscillator” in FIG. 3. Furthermore, the Examiner asserted that the drawings fail to comply with 37 CFR 1.84(p)(5) because FIG. 2 includes reference number “200” and FIG. 6 includes reference numbers “601” to “607” that are not mentioned in the specification. Moreover, the Examiner asserted that the drawings fail to comply with 37 CFR 1.83(a) because FIG. 2 fails to show the “symbol clock recovery” disclosed in paragraph 0014 and FIG 3 fails to show the “digital processor” disclosed in paragraph 0047.

It is respectfully noted that FIG. 2 as been amended with this paper to replace reference number “109” with “108,” replace reference number “200” with “106” and to add the “symbol clock recovery” designated as reference number “107.” It is further respectfully noted that FIG. 3 has been amended with this paper to replace reference number “201” with “206,” replace reference number “202” with “207” and to add the “digital processor” designated as reference number “108.” Moreover, it is respectfully noted that FIG. 5 has been amended with this paper to replace reference numbers “601” to “608” with “401” to “408” on the assumption that the Examiner meant to indicate FIG. 5 rather than FIG. 6, given that there is no FIG. 6 in the application as originally filed.

It is respectfully submitted that FIGS. 2, 3 and 5 are now in compliance with 37 CFR 1.83 and 1.84. It is respectfully requested that the Examiner withdraw the objections.

Objections to Specification

The Examiner objected to the specification due to informalities. Specifically, the Examiner objected to the following and the following corrections have been made with this paper:

The ABSTRACT contains the phrase “Disclosed is.” It is respectfully noted that the ABSTRACT has been amended with this paper to replace the phrase “Disclosed is a” with “A.”

The first mention of “OQAM,” “A/D and “NCO” in the specification are not defined. It is respectfully noted that paragraphs 0026, 0004 and 0011 have been amended with this paper to define the first mention of, respectively, “OQAM,” “A/D” and “NCO.”

There are no spaces between numbers and their units throughout the specification and

claims. It is respectfully noted that paragraphs 0015, 0030, 0032, 0043, 0046 and 0049 as well as claims 7, 9, 12 and 15 have been amended with this paper to add a space between the recited number and the corresponding units.

Paragraph 0007 should either be deleted or the description of FIG. 2 in paragraph 0007 should be changed to reflect the correct reference numbers. It is respectfully noted that paragraph 0007 has been amended with this paper to reflect the correct reference numbers in FIG. 2.

Paragraphs 0011, 0014, 0015, 0020, 0042 – 0044 and 0047 need to be changed to reflect the correct reference numbers in the corresponding figures. It is respectfully noted that paragraphs 0015, 0020, 0042 – 0044 and 0047 have been amended with this paper to reflect the correct reference numbers in the corresponding figures. It is respectfully submitted that no amendments are necessary to paragraphs 0011 and 0014 in view of the amendments made to FIG. 2 with this paper.

Paragraph 0050 should be changed to correct the figure range, with the Examiner suggesting that the range should be “Figs. 4A to 4D” rather than “Figs. 4A to 5D.” It is respectfully noted that paragraph 0050 has been amended with this paper as suggested by the Examiner.

The spelling of “squers” in paragraph 0055 should be corrected and the word “to” should be added at line 13 to change the phrase “applied all ATSC types” to “applied to all ATSC types. It is respectfully noted that paragraph 0055 has been amended with this paper to replace “squers” with “squarers” and the word “to” have been added as suggested by the Examiner.

It is respectfully submitted that the grounds for objection have been overcome. It is respectfully requested that the Examiner withdraw the objections.

Objections to Claims

The Examiner objected to claims 2, 3, 6, 8, 11, 13 and 4 due to informalities. Specifically, the Examiner asserted that that connecting terms are missing between subjects, such as “filter,” and actions, such as “performing,” in claims 6, 8, 11, 13 and 14. Furthermore, the Examiner suggested that the word “digital” be added to claim 2, line 2 such that the phrase “analog passband signal into a passband signal” is changed to “analog passband signal into a

digital passband signal.” Moreover, the Examiner suggested that the word “the” be deleted from claim 3, line 2 such that the phrase “higher than the at least two” is changed to “higher than at least two.”

It is respectfully noted that claims 6, 8, 11 and 14 have been amended with this paper to add the word “for” between the word “filter” and the word “performing.” It is further respectfully noted that claim 13 has been amended with this paper to add the word “for” between the word “recovery” and the word “multiplying” and between the word “resampler” and the word “taking.” Moreover, it is respectfully noted that claims 2 and 3 have been amended with this paper as suggested by the Examiner.

It is respectfully submitted that the grounds for the objections have been overcome. It is respectfully requested that the objections be withdrawn.

§ 112 Rejection

The Examiner rejected claims 2-4, 6, 8, 11 and 14 under 35 U.S.C. § 112, second paragraph, as indefinite for failing to particularly point out and distinctly claim the subject matter which the Applicant regards as the invention. Specifically, the Examiner objected to the following and the following corrections have been made with this paper:

There is insufficient antecedent basis for the recitation of “the fixed oscillator” in claim 2, line 3 and claim 3, line 2. It is respectfully noted that claim 2 has been amended with this paper to recite “further comprises a fixed oscillator” in line 2, thereby providing antecedent basis for the recitation of “the fixed oscillator” in claim 2, line 3 and claim 3, line 2 given that claim 3 depends from claim 2.

There is insufficient antecedent basis for the recitation of “the digital passband signal” in claim 4, lines 2 and 3. It is respectfully noted that claim 1 has been amended with this paper to recite “a digital passband signal,” thereby providing antecedent basis for the recitation of “the digital passband signal” in claim 4 given that claim 4 depends from claim 1.

There is insufficient antecedent basis for the recitation of “the first resampler” in the last lines of claims 6, 8, 11 and 14 and the word “first” should be omitted from all claims in regard to “the resampler.” It is respectfully noted that claims 6 and 11 have been amended with this paper as suggested by the Examiner and antecedent basis for the recitation of “the resampler” is

provided by, respectively, claims 5 and 10 from which claims 6 and 11 depend. It is further respectfully noted that claims 8 and 14 have been amended with this paper to replace “the first resampler” with “the A/D converter” and antecedent basis for the recitation of “the A/D converter” is provided by, respectively, claims 1 and 13 from which claims 8 and 14 depend.

It is respectfully submitted that the grounds for the rejections have been overcome. It is respectfully requested that the rejections be withdrawn.

§ 103 Rejections

Claims 1-5, 10 and 13 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Scarpa et al. (“Scarpa” U.S. Pat. No. 5,673,293). This rejection is respectfully traversed.

It is respectfully noted that the Federal Circuit has provided that an Examiner must establish a case of prima facie obviousness. Otherwise the rejection is incorrect and must be overturned. As the court recently stated in In re Rijkaert, 28 USPQ2d 1955, 1956 (Fed. Cir. 1993):

It is further respectfully noted that “In rejecting claims under 35 U.S.C. § 103, the examiner bears the initial burden of presenting a prima facie case of obviousness. Only if that burden is met, does the burden of coming forward with evidence or argument shift to the applicant. ‘A prima facie case of obviousness is established when the teachings from the prior art itself would appear to have suggested the claimed subject matter to a person of ordinary skill in the art.’ If the examiner fails to establish a prima facie case, the rejection is improper and will be overturned.” (citations omitted.)

It is respectfully noted that the Examiner asserts, at paragraph 17 of the Office action, that “figure 1, block 147 and column 8, lines 50-59” of Scarpa disclose a “symbol clock recovery for converting digital real/imaginary base-band component signal into QAM type of real/imaginary component signals” as recited by independent claim 1 and asserts the same portions of Scarpa, at paragraphs 23 and 24 of the Office action with regard to similar recitations in independent claims 10 and 13. Applicant respectfully disagrees with the Examiners interpretation of Scarpa.

It is respectfully noted that the asserted disclosure of Scarpa col. 8, ll. 50-59 is not related to “figure 1, block 147,” as asserted by the Examiner, but rather to the “ transform filter 224” and

“carrier recovery circuit 230” in “FIG. 2” of Scarpa. It is respectfully submitted that the “transform filter 224,” which is identified as the “Phase Splitter 224” in Scarpa FIG. 2, is analogous to the “phase splitter 105” identified in FIGS. 3 and 5 of the present invention and **not** analogous to the “symbol clock recovery 400 / 600” identified in FIGS. 3 and 5 of the present invention. Therefore, it is further respectfully submitted that the disclosure of Scarpa fails to support the Examiner’s asserted interpretation.

Notwithstanding the support for the Examiner’s asserted interpretation of Scarpa, it is respectfully noted that Scarpa, at col. 5, 11. 1-13 and FIG. 1, discloses that the “I and Q signal outputs of the [Passband] Nyquist filter 22 are coupled to corresponding I and Q inputs of ... the timing recovery circuit 147.” Therefore, it is respectfully submitted that the signals input to block 147 of Scarpa are “passband signals.”

On the other hand, independent claims 1, 10 and 13 recite that the symbol clock recovery converts baseband signals into OQAM type of real imaginary component signals. Therefore, it is respectfully submitted that the disclosed input signal of the asserted block 147 of Scarpa is different from the input signal of the symbol clock recovery recited by independent claims 1, 10 and 13 of the present invention.

Notwithstanding the lack of support for the Examiner’s asserted interpretation of Scarpa, it is respectfully noted that Scarpa FIG. 1 discloses that the asserted block 147 is provided **before** block 135, which is the “CARRIER RECOVERY MODULE.” It is further respectfully noted that FIGS. 3 and 5 of the present specification disclose that the “symbol clock recovery 400 / 600” is provided **after** the “carrier recovery 106.” Moreover it is respectfully noted that independent claims 1, 10 and 13 of the present invention recite that the baseband signal input to the symbol clock recovery is the output of the carrier recovery. Therefore, it is respectfully submitted that the disclosed arrangement of blocks 147 and 135 of Scarpa is different than that of the “symbol clock recovery” and “carrier recovery” of the present invention such that the structure disclosed by Scarpa is different from the structure disclosed by independent claims 1, 10 and 13 of the present invention.

It is respectfully noted that the Examiner asserts, at paragraph 17 of the Office action, that “column 5, lines 36-45” of Scarpa discloses “it is known that symbol timing recovery can be done by squaring and adding the filtered I and Q channels to produce tone at symbol frequency”

and, thereby, discloses the symbol clock recovery “detecting timing error information by performing the high pass-band filtering, squaring and adding the OQAM real/imaginary signals” as recited by independent claims 1, 10 and 13. Applicant respectfully disagrees with the Examiners interpretation of Scarpa.

Notwithstanding the prior arguments with regard to the asserted “block 47” of Scarpa, even if it is assumed that the “block 147” of Scarpa corresponds to the symbol clock recovery of the present invention, it is respectfully submitted that the operations of squaring and adding recited in claims 1, 10 and 13 with respect to detecting the timing error information are different from the disclosed operations of “block 147” of Scarpa. It is respectfully noted that the operation of “block 147” as disclosed at the asserted col. 5, ll. 36-45 as well as col. 5, ll. 57-59 of Scarpa, and which include the inherent text of “Digital Communication,” are related to “QAM.” On the other hand, it is further respectfully noted that the operations of squaring and adding recited in independent claims 10 and 13 are related to VSB. Therefore, it is further respectfully submitted that the disclosure of “squaring” and “adding” operations in Scarpa are not analogous to the squaring and adding recited in independent claims 10 and 13.

It is respectfully noted that the Examiner asserts, at paragraph 17 of the Office action, that “Where OQAM is simply ‘staggered QAM’ and all results would still hold.” It is respectfully submitted that the meaning of “staggered QAM” is ambiguous and Applicant respectfully requests further clarification of the assertion.

Notwithstanding the ambiguity of “staggered QAM,” it is respectfully submitted that the OQAM recited in independent claims 1, 10 and 13 of the present invention means “Offset QAM” where the frequency offset is applied to VSB mode as if VSB mode has the characteristic of QAM. Therefore, it is further respectfully submitted that, if “staggered QAM” is a variation of QAM, then “staggered QAM” is not analogous to the OQAM recited in independent claims 1, 10 and 13 of the present invention.

It is respectfully asserted that the Examiner has failed to establish the required prima facie case of obviousness and, therefore, that independent claims 1, 10 and 13 are allowable over the cited reference. It is further respectfully asserted that claims 2-5, which depend from claim

1, also are allowable over the cited reference. Moreover, it is respectfully asserted that claims 6-9, 11, 12, 14 and 15, for which no specific rejection was asserted, also are allowable over the cited reference.

Double Patenting Rejection

The Examiner rejected claims 1,2, 4-9, 11, 12, 14 and 15 under the judicially created doctrine of obviousness-type double patenting as being unpatentable over copending U.S. Patent Application No. 10/773,041 ('041 application). It is respectfully submitted that the '041 application and the present application are commonly owned. In the interest of expediting prosecution of this application without prejudice, a terminal disclaimer is submitted in compliance with 37 C.F.R. 1.321(b) to overcome this rejection. It is respectfully requested that the rejection be withdrawn.

CONCLUSION

In light of the above remarks, Applicant submits that the present Amendment places Claims 1-15 of present application in condition for allowance. Reexamination and reconsideration of the application, as amended, are requested.

The Examiner has cited U.S. Patent Nos. 5,872,815 to Stolle et al., 6,160,443 to Maalej et al. and 6,862,325 to Gay-Bellile et al. as being made of record and not relied upon. Applicant has studied the references and believes they neither anticipate nor render obvious the present invention either alone or in combination.

No amendment made was related to the statutory requirements of patentability unless expressly stated herein; and no amendment made was for the purpose of narrowing the scope of any claim, unless Applicant has argued herein that such amendment was made to distinguish over a particular reference or combination of references.

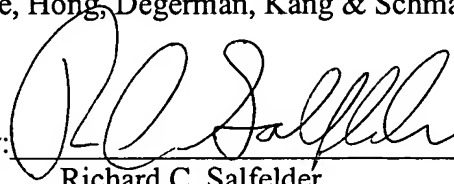
If for any reason the Examiner finds the application other than in condition for allowance, the Examiner is requested to call the undersigned attorney at the Los Angeles, California, telephone number (213) 623-2221 to discuss the steps necessary for placing the application in condition for allowance.

Respectfully submitted,

Lee, Hong, Degerman, Kang & Schmadeka

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Enclosure: Substitute FIGS. 2, 3, and 5
Terminal Disclaimer

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